DOCUMENT RESUME

ED 377 881 IR 055 368

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TITLE Next Challenges for Builders and Managers of Government Internet Services: A Report to the Information Infrastructure Task Force.
INSTITUTION Syracuse Univ., N.Y. School of Information Studies.
PUB DATE 15 Jan 95
NOTE 16p.
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120) -- Reports - Descriptive (141) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Information; Computer Networks; *Government Role; Information Dissemination; Information Management; *Information Networks; *Information Policy; *Information Services; Information Sources; Information Systems; Surveys; *Technological Advancement; User Needs (Information)
IDENTIFIERS *Government Information; Information Infrastructure Task Force; *Internet; Strategic Information Resources Management

ABSTRACT

This report represents the views and perceptions of participants at a December 1994 Strategic Information Resources Management (SIRM) seminar, held in the District of Columbia, entitled "Building and Managing Government Internet Services." The group was comprised of 67 government officials and contractors who either had or were about to develop Internet services. Two survey instruments were used to identify the following key issues and concerns regarding building and managing government Internet service: technical challenges; security, encryption, document integrity, etc.; data quality and organization; cost and funding issues; moving the barriers created by bureaucracy; integrating Internet service with agency mission and function; developing external partnerships with non-governmental organizations and the commercial sector; understanding and communicating with users; evaluation criteria for extensiveness, efficiency, effectiveness, impact and usefulness; personnel and training needs; and federal or agency policy adjustments. The survey also sought to identify current best practices and to elicit solutions to issues and challenges during the transition to an electronic/digital environment. The respondents determined what strategic benefits to their agency had resulted thus far from providing Internet government services, including improved communication, coordination, and collaboration; wider dissemination of information; and enhanced agency profile. Internet-based government services make government more accessible, efficient, and responsive to the needs of the people. In conclusion, several recommendations are made to the Information Infrastructure Task Force (IITF) to help achieve this end. Contains 13 references. (Author/MAS)

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NEXT CHALLENGES FOR BUILDERS AND MANAGERS OF GOVERNMENT INTERNET SERVICES:

A Report to the Information Infrastructure Task Force

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January 15, 1995

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INTRODUCTION

In December, 1994 Syracuse University, School of Information Studies held a Strategic Information Resources Management (SIRM) seminar in Washington, D.C., entitled "Building and Managing Government Internet Services" for 67 government officials and contractors who had developed these services or were about to do so. We invited the participants in the seminar to comment on a series of questions of significance to them and, we believe, the Information Infrastructure Task Force (IITF). We are providing the IITF with this information in the hope that you will find it useful in your deliberations. The comments below are not representative of some larger population. Rather they represent some of the views and perceptions of a vitally important group, those who have built or are about to build government Internet-based, services.

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It is important to recognize a number of factors affecting the context in which participants offered these views. First, there has been exponential growth of Internet-based government services and information over the past year. Increasingly, government agencies are making information available electronically via bulletin boards, gopher sites, or web servers. Moreover, the National Performance Review (Gore, 1994a), initiatives from the Information Infrastructure Task Force (IITF), other initiatives of the Administration (such as Americans Communicating Electronically (ACE)), and the Congress have encouraged agencies to move onto the Internet.

Secondly, recent technological developments have combined to encourage greater government use of the Internet. Connections to the Internet are increasingly easier to obtain and are available at a more reasonable cost; gopher software and World Wide Web applications such as Mosaic and Netscape provide new and easier approaches to make information available on the network; and prices for telecommunications applications continue to drop.

Finally, it should be recognized that the views reported here occurred shortly after the results of the November, 1994 elections which resulted in Republican majorities in both the House and the Senate. The government officials attending the seminar were very much aware of the new Congress' promises to reduce the size and cost of government. Indeed, a number of the participants came from agencies were major "reorganizations" and/or "downsizing" were in process or were about to begin. A number of these agencies believed that use of Internet-based information services would contribute to more effective government and better "connections" with the public -- if they were able to continue their efforts.

This report is not a literature review or assessment of Federal agency use of Internet services or issues related to the development of the Internet and the National Information Infrastructure (NII). Some beginning sources that may be of use for those interested in introductory reading related to these topics include reports from the Congressional Research Service (Smith 1994); from the General Accounting Office (1994); from the National Performance Review (Gore, 1994b) and from the Information Infrastructure Task Force (1994a, 1994b, 1994c).

STUDY POPULATION

The group surveyed were 67 participants in an all day, third annual, Strategic Information Resource Management (SIRM) seminar entitled: "Building and Managing Government Internet Services" sponsored by Syracuse University's School of Information Studies in Washington, DC on December 15, 1994. The majority of this group were middle and senior managers in federal agencies with a mean of 15 years government service. Also represented were six or seven contractors who provide components of an Internet service to government agencies and three members of the Canadian government. Job titles included: director of standards and specifications, library manager, sales in systems integration, audit manager, public affairs officer, Internet services project manager, computer specialist, deputy assistant inspector general,director of technical information, chief of the information resources center, training officer, LAN manager, chief of network services, and operations research analyst.

The majority of participants had built or managed a government Internet service over the preceding 18 months. The rest of the participants were scheduled to build or manage a government Internet service within the next 18 months. Two survey instruments were used (see attached). The first instrument ("Getting Acquainted") was administered at the beginning of the seminar to gain demographic and background information. The second instrument was administered as part of a small group exercise occurring near the end of the seminar. Respondents were first asked to react to the questions

individually and then discuss the questions in small groups with a group recorder taking notes. The small group discussions were then summarized for the entire group of seminar participants.

STUDY FINDINGS

The findings reported here provide an overview of the key issues and concerns that were raised by participants. To the extent possible, the authors have also included comments made during the seminar itself as well as comments from the questionnaires.

Issues and Challenges

The survey instruments were designed to identify the issues being faced by government Internet service builders and managers or challenges on the horizon. The following is a summary of the most frequently discussed issues and challenges mentioned by the participants.

Technical Issues

There were a number of technical concerns expressed by the respondents which can be grouped by new and experienced builders. For those just getting started building an Internet service, their concerns included: simply getting the service up; obtaining software, hardware, and telecommunications connectivity; deciding between gopher and WWW server or opting for both; and determining how to put data on to the system. Determining where to look on the Internet for software, standards, technical support, and documentation was a frequently mentioned problem. A number of participants immediately began using Ryan's (1994b) guide (distributed to SIRM participants at the beginning of the conference) to locate these hard to find Internet sources. Moen (1994) and Moen and McClure (1994) discuss the recent progress of standards development within government.

Experienced builders were concerned with the use of forms to obtain information from service users; database search engines and providing Internet access to, and integrating, existing agency legacy databases and database engines; technical solutions to the great disparity among users equipment (e.g. Lynx v. Mosaic), technical solutions to maintaining accurate pointers to data sources; multi-media use; interface design; and data structures and ways to organize storage of materials so that they could be used by multiple services for multiple purposes. A number of experienced builders noted that the backbone was sometimes unreliable and overloaded. All were concerned about how to keep up with the rapid pace of technology, continued difficulties of procuring state-of-the-art technology, and service provision changes.

Security

The issues of security, encryption, firewalls, maintaining service and document integrity, digital signatures, and balancing security v. functionality was on virtually all participants lists. Participants noted that until security issues could be better managed, electronic commerce and the selling of services and products from individual agencies would be difficult to implement. They also commented on the lack of expertise and knowledge in some agencies to deal with these issues.

Data Quality & Organization

Many respondents noted that the issue of data quality was actively under consideration by their agencies at the present time. Participants who had successfully mounted an Internet service over the past year were now moving their attention to improving the content of the Internet service. Issues included:

- What to put on the server?
- Who would be allowed to contribute materials, should contributors be limited to within the agency, other agencies, or outside government?
- How to get quality information providers on board and keep them enthusiastic?
- What specific personnel should be in charge of resource discovery, accuracy, and currency?
- How to build the quality issue into file and data structures (e.g., who is responsible, expiration dates, etc.)? How to put periodic review procedures into agency policy?
- How to better ways to organize information contained on the Internet service?
- How to keep up with the plethora of sources and the lack of network organizing tools?

Ryan's (1994a) guide to known government Internet services (distributed to SIRM participants) was well received as an excellent tool to identify and assess these sources.

Several participants noted that a user's image of an agency would shaped and determined by the quality of the data presented on the Internet service. Indeed in some domains, bad information could mean loss of life, property, or money and the potential for legal suits were increasingly real. Others noted that users had differing expectations in terms of quality levels and would tolerate differing levels of quality for different databases. All were concerned about accountability and accuracy issues connected with data that was continuously changing.

Ways to ensure data quality discussed included assignment of responsibility for the quality of specific data to a specific person; clear statements to users about the quality of the data provided (e.g., a clear statement in a Read Me file of scope, etc.). Several mentioned the importance of not releasing data to the public until the data had been verified.

Cost & Funding Issues

Respondents remained concerned about a number of resource allocation issues when building, managing, maintaining or scaling, government Internet services. Most anticipated a funding resources crisis during the next several years. The sense of the group was that Internet service provision would continue to be a growth area within government even within fiscally difficult times. Several participants attended the seminar to network for employment in the event of loss of job or loss of agency! Key challenges discussed included:

- How to support the maintenance and expansion of a government Internet service now that it is operational
- How to obtain graphics, editorial, R & D and technical support from internal agency units;
- Figuring out what the actual costs are to provide a service
- Figuring out who should pay and how to recover the costs
- Assessing the impact of commercial entrants on to the Internet
- How to price Internet services and whether end-users, particularly citizens, should be charged at all.

At present most do not charge for Internet services and do not see themselves doing so in the near term. The principal rationale is getting the information to the citizen and making the information widely available.

Respondents noted a number of influences on price determination including: by type of media, by how directly tied the product was to the agency mission, by the type of audience (a business might pay more than a citizen), and by the demand (too much and you raise the price). Several commented that "politics not reason" often determined price. Many said that there were few working pricing mechanisms and believed that guidance was unclear or unavailable. A government contractor remarked that they presently charge government agencies by the project and the hour. There was a concern to find a way to recover costs for R & D, demonstrations, and training.

Moving the Bureaucracy

Respondents noted a number of barriers to creating, maintaining and expanding government Internet-based services due to bureaucratic inertia including:

- Senior management problems: getting their attention and interest amidst indifference, ignorance, unrealistic expectations. Many remarked on the lack of senior management vision, commitment, participation, and knowledge. Several commented on the resulting wild and unreasonable expectations senior managers often had. While others commented on senior managers unwillingness to take risks. Summarizing: integration of an Internet service into agency practice is tough from the bottom up.
- An increase in existing inter-departmental tensions. For example, several commented on rising tension and conflict between technical v. managerial v. public services personnel. In some cases it was the "mainframe folk" against the "client-server upstarts"; other times it was mis-communication, other times it was the technical personnel unable or unwilling to address user assessment and service attitude issues.
- Difficulty of determining who will be in charge of what. Do old paper-based roles transfer to digitally-based responsibilities? Must every job be reinvented?

Existing roles, policy, and procedures were found to be at best ambiguous, but more commonly dated, inadequate, and slow. Respondents remarked that the needed agency management mechanisms are not yet developed and that as a result responsibility falls through the cracks. Respondents also noted the increased speed of bureaucratic response forced by network service provision, a speed substantially faster than the government is presently able to muster.

Integrating Internet Service with Agency Mission and Function

For many participants who had successfully mounted a prototype Internet-based government service this issue was seen to be key over the next several years. The challenge was expressed in several ways:

- How to incorporate the new Internet technology and services while maintaining legacy systems?
- How to get existing agency databases and information onto the Internet easily?
- How to migrate existing print publications onto the Internet, maintaining old services while growing new ones?
- How to cope with the politics, turf-battles, and power questions?
- How to coordinate and integrate the various units within an agency that build, manage, and maintain the agency's Internet services?
- How to coherently describe to the users of our Internet service what it is our agency does and does not do?

For most, there was recognition that the issue was important. Most respondents commented that they did not have answers yet, it was too early to tell, or simply there was very little cooperation at present. Several mentioned shared workshops, joint planning efforts, task forces, and agency-wide task groups. All stressed that these efforts came from the bottom up.

Respondents were asked where in your organization should responsibility for Internet Services reside? There was general agreement that the responsibility should not be with the computer or technical services departments as they were out of touch with users and agency needs. The general consensus was for a shared approach either formalized as a team or committee or diffused among the various players at a level closest to the customers as practicable. Identified constituencies included: technical support, librarians, public service officials, data owners, and management. One group present had already successfully formed an Internet unit combining the skills of a number of other internal agency units.

Developing External Partnerships

Respondents were asked to comment on partnerships with external providers of related Internet services. Most said external collaboration had not happened yet but was possible and desirable. Several had successful stories to tell, both between agency and user community (often scientists) and between agency and commercial sector. Most services had pointers to other agency, government, and non-governmental sources of information as part of their Internet service. One contractor noted that there

were contractors who couldn't afford to or couldn't obtain permission from government agencies to disseminate copies of government publications via the Internet.

There was wide agreement that partnerships between and among agencies and with non-governmental organizations was useful and should be encouraged. Efforts such as that by the United States Postal Service with their Kiosk program were noted as good first steps. But many commented that there currently were few rewards for such partnering and that a number of examples where agencies were engaged in "turf" wars could be identified.

Understanding & Communicating with Users

For most of the participants the ability to rapidly interact with their agency's clientele was seen as one of the principal assets of an Internet service. But there was general recognition that all were just learning in terms of what this will mean for their Internet services and their agency. Issues discussed included:

- How to identify who their users (actual and potential) are?
- How to understand the users of an agency's Internet service and their needs and level of service requirements?
- How do Internet service users differ from traditional agency users?
- How to target specific groups of users and match them to services?
- How to anticipate the volume of user feedback, how to manage the success of heavy user response (particularly in the face of less staff) or avoid being underwhelmed by demand?
- How to reach users with differing degrees of accessibility and equipment (e-mail v. WWW)?
- How to portray the agency to both in-house users (e.g., new employees) and end users effectively?
- How to rationalize user needs versus agency priorities?
- How to manage a community of users only some of whom you are responsible for directly; others, within the agency, whom you can only partially influence; and, still others, external to the agency, where influence can be very indirect?

For all, describing an explaining the agency and its services in a manner that is interactive, clear, and useful to Internet users is a new challenge. The approach that some agencies have taken with their Bulletin Board Systems (BBS) as a means for communicating with users was, participants noted, often counter-productive (Bertot and McClure, 1994).

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Evaluation Criteria

Most of the seminar participants had as a key concern developing internal and external criteria to use when evaluating Internet services. During the seminar, itself, participants commented on the need for evaluation criteria that could be used to assess the success of Internet-based services. McClure proposed the following criteria as a beginning point:

- Extensiveness: this is a measure of the amount or extent to which the services are provided, e.g., the number and types of people using the service.
- Efficiency: this is a measure of the cost or resources required to provide the service, e.g., cost per service transaction.
- Effectiveness: an effectiveness measure is one that focuses attention on "how well" or the quality with which a service or activity is done, e.g., percentage of transactions that satisfactorily met user information needs.
- Impact: an impact measure focuses attention on the benefit or result of the service or activity, e.g., the degree to which using the Internet services empowered the user to resolve other problems or improved his/her quality of life.
- Usefulness: this is a measure of appropriateness, that is, the degree to which the services are useful or appropriate for the individual user, e.g., percentage of services of interest to different types of user audiences.

Most had made little progress in developing these criteria to produce specific performance measures.

Personnel & Training Issues

Personnel and training issues remain a significant ongoing challenge for most of the builders and managers of government Internet services that participated in the SIRM seminar. Respondents noted a number of concerns including:

- How to train in-house users and end-users and gain their acceptance of the Internet service?
- How to address technophobia and its consequences (particularly among senior staff)?
- How to keep up with the rapid pace of technology and service provision changes?
- How to compensate in a systematic fashion for ongoing loss of critical skills and key staff, staff reassignment, staff turnover, or simply a lack of skilled staff?
- How to make use of staff with partial skills? For example, graphic designers who had not designed for the Internet before or UNIX programmers who had not used the Internet.

Indeed, the need to train the trainers was what brought many of the participants to the SIRM seminar. But overall, much work needs to be done in training Federal Information Resources Managements and others regarding Internet applications (McClure, 1995).

Respondents were asked what they wished they knew more about connected with the provision of Internet Services. Responses included: encryption and security, cost recovery, electronic publishing do's and don'ts, how to make information more accessible and less overwhelming, how to get feedback from end-users, WAIS and other search engines, integrating legacy databases into the WWW server environment, how to re-educate folks from a paper-based mentality to a desktop digital one, ways of simplifying user access, how to be a better trainer and obtain better training materials, organizing and managing a net service, and artificial intelligence applications, telecommunications technologies, data structures and file formats, copyright, and cost effective data collection and analysis.

Policy Issues

Seminar participants were asked what near-term federal or agency policies are needed to assist government Internet services? Reaction was varied including the need that several builders and managers felt to get (or keep) government "off our back." Many remarked that the medium and the present stage of development doesn't lend itself to strict regulation. The clear preference of the participants was for voluntary coordination with "carrots" (e.g., awards for innovative service) offered as well as "sticks." Specific responses included the need for policies which address:

- Assigning and controlling ownership, editorial content, and data preparation, update and currency of Internet materials.
- Electronic FOIA implications for agency policies, procedures, and practices.
- Foreign versus domestic access to Internet-based government materials.
- The Internet's impact on the information have nots and ensuring Universal Access. What minimum standards can agency Internet planners assume all citizens will have in terms of access, type of equipment, and means of provision?
- Specific further affirmation that it was "ok to do business via the net" instead of via paper.
- Maintaining appropriate privacy controls over communications with customers.
- Standardized, uniform method of conducting transactions and electronic data interchange over the Internet which is easy, reliable, and secure.
- Who is in charge of government-wide Internet services, related policies, procedures, guidance, and who will take the lead championing inter-agency coordination in this area?
- When to price and when not, how to charge, for what?
- Next steps in achieving a government-wide GILS.
- Expansion of the HTML standard to include rich text and other areas.
- A standard for domain name addressing practices within government.

Several remarked on the need for a central source for model policies, procedures, and contracts related to government Internet service provision. In general existing paper-based policies were found to be inadequate, unnecessarily constraining, or non-existent in the digital environment. Summarizing: the old policies barely work and the new has not yet been worked out.

BEST PRACTICES AND SOLUTIONS

The survey also sought to identify current best practices and to elicit solutions to the issues and challenges the participants face during the transition from an industrial/paper base to an electronic/digital method of workflow, service provision, and management.

Several respondents identified current best practices. There was praise for government-wide efforts that work including the NPR and ACE. Many felt that getting a server up and running itself (even if it may not initially have much on it) was a best practice achievement. Others noted how much has been accomplished despite the absence of senior management understanding or support. Several remarked on the voluntary (almost guerrilla) efforts to get government information out to the public no matter how. Others praised making Congressional bills, the Federal Register, and key reports easily available. Still others praised dual-use Internet services used for both internal as well as external purposes.

A number of best practices which should be put into place were identified, both large and small. There were calls, echoing the morning seminar presentation by Charles R. McClure, for a renewed user-based, service, orientation (e.g., doing a customer needs assessment prior to building an Internet server). The need for better Read Me files (echoing the presentation by Joe Ryan) and a call was made for a government-wide building and managing Internet services handbook that captures key experiences, insights, practices, and even instructions concerning how to build and manage Internet services.

A need was seen for formal classification and indexing of information made available on Internet servers (keyword access via WAIS is not enough). The need for automated, real time delivery of information to Internet servers (so that the information is the most current possible) was mentioned. Several respondents called for greater attention to balancing the need to experiment with the need to offer standard and reliable products and services. The need for participatory design involving as many from within and outside the agency in a coordinated plan of government Internet services development was also discussed.

Participants commented on the need to stay better informed about "best practices" within agencies. They wondered if the IITF might identify and make known where such "best practices" were in the government.

STRATEGIC BENEFITS FOR AGENCIES

Seminar participants were asked to identify strategic benefits to their agency that had resulted, thus far, from the provision of government services via the Internet. Responses included:

- Improved "desktop" level internal agency communication, awareness, and empowerment;

- Improved inter-agency coordination and collaboration (identification of agencies with similar interests, ease of contact, virtual meetings across geographically isolated spaces, ease of coordination);
- Wider, more timely, efficient, and enhanced public dissemination of government information;
- Enhanced contact with, and awareness of, the agency's customers;
- Greater awareness of the state-of-the-art in information technology;
- Reduction of paper flow;
- Enhanced agency profile; and,
- Increased agency customer base.

They also commented on the need to better identify and measure these benefits and asked if there were any formal reports or studies that had examined these issues. Once again, participants commented on the need for the IITF (or someone) to identify, define, and develop methods to measure benefits resulting from the provision of Internet-based services.

CONCLUSIONS

Over the past three years the SIRM December seminar has targeted a key group of middle and senior government agency officials interested in the provision of Internet services. The sense remains that if lasting change in federal information management practice is to come, this is the group who will lead the effort, mirror the key issues and opportunities, and have the greatest impact.

Each year has seen a dramatic increase in the awareness of the Internet, interest, knowledge base, and achievements of these government officials. In December 1992 many agency officials hadn't heard of the Internet and were not sure they wanted to know about it. At the December 1993 session the issue was what do "I as an agency official" need to know to introduce the Internet to my organization and its users properly. The sense was that there was now a critical mass of informed and excited agency middle management. Over the past 12 months the increase in the availability and use of the Internet by government has soared. An important shift has occurred during this period. Early government middle management Internet *users* have moved on to become the *builders and managers* of government Internet services.

The IITF should be congratulated for its efforts in promoting a range of initiatives that have been moving government information and services to an Internet environment. Despite a lack of resources in individual agencies there is still much excitement and good will on the part of at least these participants to extend Internet-based government information and services. Yet given the existing political context of significant reductions in both the size and cost of government, one has to wonder how various initiatives related to building and managing government Internet services will fare in the immediate months ahead.

One important perspective that participants frequently stated was extending and promoting Internet-based government services as a means for making government more accessible, more efficient, and more responsive to the needs of the public. Toward that end, the IITF may wish to consider the following recommendations:

- Identify and publicize agency "best practices" in building and managing Internet services.
- Promote more opportunities for agency officials to receive in-depth training on how to build and manage Internet services.
- Develop strategies that reward agency officials for experimenting with and implementing innovative Internet-based information and services.
- Conduct studies that identify specific benefits resulting from Internet-based services and produce metrics that can measure those benefits.
- Encourage government-wide assessments of existing agency-based Internet services to determine the strengths and weaknesses of these services and to be able to recommend specific improvements so that these services can better meet user needs.
- Develop guidelines and other sources related to building and managing Internet services that would assist agencies move to this networked environment so that agencies can better learn from the experiences of other agencies.
- Integrate Internet-based services into the overall political strategy of the National Performance Review, improving government operations, and empowering the individual.

These recommendations are not intended to be comprehensive. Rather, they suggest the main areas of interest and concern by seminar participants.

We believe that the above report provides members of the IITF with a useful snapshot of the challenges and issues that this key group of government officials are facing and are likely to face in the next 12 - 18 months. Careful attention to the opportunities, issues, and roadblocks identified by these important stakeholders will speed the adoption and use of the emerging information superhighway by all and result in a more visible, responsive, and effective government.

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APPENDIX

Syracuse University, School of Information Studies, Strategic Information Resources Management Seminar

Getting Acquainted While Waiting To Start The Seminar

1. Briefly describe your present job & title:_____

2. How long have you served in the government (of any type and in any capacity)? _____

3. Have you built or managed an Internet service? YES NO

4. Will you over the next 18 months? YES NO

5. What do you hope to see discussed at today' s seminar?

_____

_____

_____

6. What barriers have you encountered when developing an Internet service for your organization (or for other organizations)?

_____

_____

_____

7. What are three key issues you face when building and managing Internet services?

_____

_____

8. What do you consider the best practice that you have been involved with that is worthy of emulation by others developing Internet services?

_____

_____

9. Tactics like using Internet services to reduce disesemination costs are becoming common place. Are there strategic purposes for Internet services in your organization?

_____

_____

_____

10. What do you wish that you knew more about connected with the provision of Internet Services?

_____

_____

Additional comments can be written on the back. Thank you for your thoughts!
Forget to turn it in? Fax it to Joe Ryan Phone: (315) 443-2911 Fax: (315) 443-5806

APPENDIX

Syracuse University, School of Information Studies, Strategic Information Resources Management Seminar

Small Groups: Sharing and Summarizing What We Know

The SIRM seminar organizers have been asked by the Information Infrastructure Task Force (IITF) to gather input on a variety of issues faced by government Internet service providers. Your written thoughts here today will be compiled and presented to the IITF and sent to you within a month.

1. What will be the three most critical incidents you will encounter over the next 18 months?

2. How will you price your Internet Services, now and in the future? What is the reasoning you will use?

3. Does data quality matter? How do/will you handle it in your Internet service?

4. What near-term federal or agency policies are needed to assist government Internet services?

5. Where in your organization should responsibility for Internet Services reside? Why?

6. Describe the extent of cooperation occurring between Internet services within your organization?

7. What about coordination with external providers of related Internet services? Has there been any coordination of services? If so, describe, if not, is this on your to do list? Who will do what? Why?

8. Are there other issues that are important for the group to discuss?

Additional comments can be written on the back. Thank you for your thoughts!
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